FISH & RICHARDSON P.C.

Frederick P. Fish
1855-1930

W.K. Richardson
1859-1951

4225 Executive Square
Suite 1400
La Jolla, California
92037

Telephone
619 678-5070

Facsimile
619 678-5099

Web Site
www.fr.com

July 15, 1999

Attorney Docket No.: 09952/029001/51697-US

Box Patent Application
Assistant Commissioner for Patents
Washington, DC 20231

BOSTON

NEW YORK

SILICON VALLEY

SOUTHERN CALIFORNIA

TWIN CITIES

WASHINGTON, DC

Presented for filing is a new original patent application of:

Applicant:	AKIO KOSAKA
Title:	RADIO COMMUNICATION TERMINAL HAVING VARIABLE DATA TRANSMISSION SPEED RESPONSIVE TO BUILT-IN BATTERY

Enclosed are the following papers, including all those required to receive a filing date under 37 CFR §1.53(b):

	Pages
Specification	14
Claims	2
Abstract	1
Declaration	3
Drawing(s)	5

Enclosures:

- Assignment cover sheet and an assignment, 2 pages, and a separate $40.00 fee.

BOX PATENT APPLICATION
July 15, 1999
Page 2

- New disclosure information, including:
  Information disclosure statement, 2 pages.
  PTO-1449, 1 pages.
  References, 5 items.
- Certified copies of the priority applications will be filed at a later date.
- Postcard.

Under 35 USC §119, this application claims the benefit of foreign priority applications filed in Japan, serial number 10-214477, filed July 29, 1998 and serial number 10-312030, filed November 2, 1998.

Basic filing fee	$ 760.00
Total claims in excess of 20 times $18.00	0.00
Independent claims in excess of 3 times $78.00	0.00
Multiple dependent claims	0.00
Total filing fee:	$ 760.00

A check for the filing fee is enclosed. Please apply any other required fees or any credits to deposit account 06-1050, referencing the attorney docket number shown above.

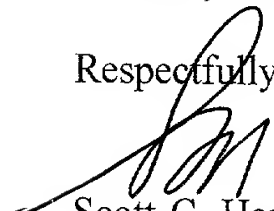If this application is found to be INCOMPLETE, or if a telephone conference would otherwise be helpful, please call the undersigned at 619/678-5070.

Kindly acknowledge receipt of this application by returning the enclosed postcard.

Please send all correspondence to:

Scott C. Harris
Fish & Richardson P.C.
4225 Executive Square, Suite 1400
La Jolla, CA 92037

Respectfully submitted,

Scott C. Harris
Reg. No. 32,030
Enclosures

APPLICATION

FOR

UNITED STATES LETTERS PATENT

TITLE: RADIO COMMUNICATION TERMINAL HAVING VARIABLE
DATA TRANSMISSION SPEED RESPONSIVE TO BUILT-IN
BATTERY POWER

APPLICANT: AKIO KOSAKA

RADIO COMMUNICATION TERMINAL HAVING VARIABLE DATA TRANSMISSION SPEED RESPONSIVE TO BUILT-IN BATTERY POWER

CROSS REFERENCE TO RELATED APPLICATION

This application relates to and incorporates herein by reference Japanese Patent Applications No. 10-214477 filed on July 29, 1998 and No. 10-312030 filed on November 2, 1998.

BACKGROUND OF THE INVENTION

1.   Field of the Invention

The present invention relates to a radio communication terminal operable with electric power supplied from its built-in battery, and particularly to a cellular video telephone.

2.   Related Art

JP-A-8-9347 discloses a cellular video telephone having a built-in or internal battery therein. This device has a power monitoring circuit, which detects remaining electric power of the built-in battery, and prolongs communication period by varying data transmission speed in response to the detected remaining battery power. Specifically, a frame rate, which is the number of picture images to be coded and transmitted per second, is calculated based on the detected remaining battery power, and dynamic or real-time image signals are coded by an image coding circuit at the calculated frame rate. Thus, the power consumption in the image coding circuit is reduced as the remaining battery

1

power decreases, while reducing motions of dynamic images which results in lessening of the quality of dynamic image display to some extent. However, the reduction in the power consumption of the image coding circuit is still small in comparison with the total power consumption of the cellular video telephone.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a radio communication terminal operable with its built-in battery, which has lower power consumption and longer communication period.

It is another object of the present invention to provide a radio communication terminal operable with its built-in battery, which transmits data at higher communication speeds with less power consumption of the built-in battery.

According to the present invention, a radio communication terminal such as a cellular video telephone has a built-in battery. The remaining electric power of the battery is detected. The data communication speed and the display of image on a display are variably controlled based on the detected remaining battery power, that is, the communication speed is lowered and the display is turned off, as the remaining battery power decreases. In addition or alternatively, the communication speed and the image display are controlled variably based on availability of an external

2

power source in the course of communication. That is, as long as the built-in battery is being charged by the external power source, the communication speed as well as the quality of dynamic image display is increased than when the built-in

5   battery is not being charged.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features and advantages of the present invention will become more apparent from the following detailed description made with reference to the accompanying

10   drawings. In the drawings:

Fig. 1 is a block diagram showing a radio communication terminal according to a first embodiment of the invention;

Fig. 2 is a graph showing a relation between data

15   transmission speed and electric power consumption of the radio communication terminal shown in Fig. 1;

Fig. 3 is a flow diagram showing a communication control routine of the radio communication terminal shown in Fig. 1;

20   Fig. 4 is a block diagram showing a radio communication terminal according to a second embodiment of the invention;

Fig. 5 is a schematic view showing an outlook of the radio communication terminal shown in Fig. 4; and

Fig. 6 is a flow diagram showing a communication

25   control routine of the radio communication terminal shown in Figs. 4 and 5.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention will be described in further detail with reference to two embodiments, in which the same or like parts are designated with the same or like reference numerals. The embodiments are directed to a cellular video telephone, which communicates with both voice and dynamic images. In the embodiments, a communication or access may be carried out in the CDMA (code-divided multiple access) processing using divided codes or a TDMA (time-divided multiple access) processing.

(First Embodiment)

Referring first to Fig. 1, a cellular video telephone comprises a control unit 1, which includes a programmed microcomputer and is connected to a radio unit (transmitter/receiver) 2 connected to an antenna 3 through its transmitter/receiver terminal.

The control unit 1 is connected to a voice processing unit 4, which is connected to a speaker 5 for outputting sound messages and a microphone 6 for inputting sounds. The control unit 1 is connected to an image processing unit 7, which is connected to a display 8 for displaying picture images and a camera 9 for inputting picture images. The control unit 1 is further connected to a keyboard unit 10 having a number of key buttons labeled as POWER, SEND, END, IMAGE, numeric figures 0 - 9 and the like.

Further, the control unit 1 is connected to a power monitoring circuit 11, which includes an analog/digital (A/D)

4

circuit connected to a built-in battery 12. The battery 12 is connected to supply the above units with electric power. The voltage of the battery decreases as the remaining or available electric power of the battery 12 decreases. The power monitoring unit 11 detects the voltage of the battery 12, so that the control unit 1 may calculate the remaining power of the battery 12 from the detected battery voltage.

The control unit 1, particularly the microprocessor therein, is programmed to effectuate the following operation in generally known manner.

That is, when a user of the cellular video telephone presses the POWER button on the keyboard unit 10, the video telephone is enabled to operate with the electric power supplied from the battery 12. The antenna 3 receives radio signals from nearby base stations and transmits a signal having the highest electric field to the radio unit 2 as a high frequency signal. The radio unit 2 responsively transmits the received signal to the control unit 1 after converting it into a base band signal by a high frequency amplifier, a receiver mixer and the like. The control unit 1 demodulates the base band signal to provide a report information included in the received radio signal. If registration of location is required in the report information, the control unit 1 converts a location registration information into a transmission base band signal to be transmitted to the radio unit 2 in return. The radio unit 2 converts the transmission base band signal into a high

5

frequency signal by a transmitter mixer and transmits it as a radio signal from the antenna 3 through a power amplifier and the like. Thus, the cellular video telephone, particularly the control unit 1, is put in a wait condition.

In issuing calls, the user (caller) inputs a phone number of an opponent user (call-receiver) through key operations on the keyboard unit 10. The control unit 1 responsively causes the image processing unit 7 to display the inputted phone number on the display 8. When the user presses the SEND button on the keyboard unit 10 after checking the displayed phone number to effectuate calling, the user is enabled to start communication. Voice of the user is converted into an electric signal by the microphone 6 and is applied to the voice processing unit 4 as a voice signal. The voice processing unit 4, after amplifying and converting the voice signal into a corresponding digital signal, compresses the converted voice signal into a low bit rate signal by its voice coding circuit. This low bit rate voice data signal is applied to the control unit 1.

When the user presses the IMAGE button on the keyboard unit 10, the image of the user is converted into an image signal by the camera 9 to be applied to the image processing unit 7 as long as a high speed data transmission in excess of 64k bps is possible due to good radio transmission condition. The image processing unit 7, after amplifying and converting the image signal into a corresponding digital signal, compresses the converted image signal into a low bit rate signal by its

image coding circuit. This low bit rate image data signal is applied to the control unit 1.

The control unit 1 subjects those voice data signal and the image data signal into the code-divided multiplex access (CDMA) processing and digital modulation to transmit the resulting signal to the radio unit 2 as a base band signal. The radio unit 2 responsively converts this base band signal into a high frequency signal and transmits it from the antenna 3 to the base station after power amplification.

When the antenna 3 receives a radio signal from the base station in return, it transmits the received radio signal to the radio unit 2 as a high frequency signal. The radio unit 2 converts this high frequency signal into a base band signal to be transmitted to the control unit 1. The control unit 1 demodulates and converts the base band signal into a voice data signal and an image data signal by subjecting it to the CDMA processing.

The voice processing unit 4 expands the received voice data signal by a voice demodulation circuit into a corresponding digital voice signal, which is in turn converted into an analog voice signal to drive the speaker 5 for providing a voice message. The image processing unit 7 similarly expands the received image data signal by an image demodulation circuit into a corresponding digital image signal, which drives the display 8 to provide an image of an opponent user or the like.

In receiving calls, a call message is transmitted from

7

the base station to be received by the antenna 3 under the wait condition. The radio unit 2 converts a received radio signal into a base band signal to be transmitted to the control unit 1. The control unit 1 processes this base band signal

5   and recognizes an arrival of message to effectuate a call-responsive operation such as ringing. After this operation, the same operation as described above with respect to the call-issuing operation is carried out.

In the above operations, high speed communication is
10   enabled by the use of the multiple coding method in the case of CDMA and by the use of the multiple slotting method in the case of TDMA. For instance, the communication speed is increased three times by the use of three multiple codes in the case of CDMA and by the use of three multiple slots in
15   the case of TDMA. In those instances, however, as shown in Fig. 2, the transmission power or electric power consumption for transmitting the voice data and image data from the antenna 3 increases as the data transmission speed increases, thus shortening the communication period.

20   Therefore, the control unit 1, particularly the microcomputer, is so programmed that the data communication speed is variably controlled based on the remaining electric power of the built-in battery 12.

Specifically, the control unit 1 proceeds from a main
25   control routine to the call-issuing control routine shown in Fig. 3, when the phone number to be called is input and the SEND button is pressed through the keyboard unit 10. The

8

control unit 1 calculates first at step 101 the remaining

electric power of the built-in battery 12 based on the battery

voltage detected by the power monitoring circuit 11, and then

checks at step 102 whether the calculated remaining power is

5   more than 10% of the maximum power.

If the remaining power is less than 10% (NO), the

control unit 1 further checks at step 103 whether it is more

than 1%. If the remaining power is more than 10% (YES), the

control unit 1 sets the data communication or transmission

10   speed to 64k bps at step 104, and then effectuates the image

communication mode and the voice communication mode at step

105. In this image communication mode, the control unit 1

causes the image processing unit 7 to reproduce the opponent

user (call-receiver) on the display 8 and to receive the image

15   of the user (caller) through the camera 9. In the voice

communication mode, the control unit 1 causes the voice

processing unit 4 to reproduce the voice of the opponent user

through the speaker 5 and to receive the voice of the user

through the microphone 6. Thus, this communication mode

20   effectuates both the voice communication and the image

communication.

The control unit 1 then proceeds to step 106 to check

whether it is an end of the communication. If the check result

is YES indicating that the END button on the keyboard unit

25   10 is pressed or the communication is terminated at the

opponent user side, the control unit 1 returns to the main

routine to execute a communication termination processing.

If the check result at step 106 is NO, the control unit 1 returns to step 101 to repeat the above sequence of processing.

Further, if it is determined at step 103 that the remaining power is more than 1% (YES), the control unit 1 sets the communication speed to a lower speed, 8k bps, at step 107. After step 107, the control unit 1 enables only the voice communication at the speed of 8k bps at step 108. The control unit 1, however, returns to the main routine to execute the communication termination processing if the remaining power is determined to be less than 1% (NO) at step 103, thus disabling both of the voice communication and the image communication.

In the voice communication mode at step 108, the control unit 1 causes the voice processing unit 4 to reproduce the voice of the opponent user through the speaker 5 and to receive the voice of the user through the microphone 6. The control unit 1 further disables the image processing unit 7 to operate normally. That is, the image processing unit 7 is enabled to continue to display on the display 8 only the last one of the dynamic images displayed in the image communication mode by storing one frame of image in its memory, and the electric power supply to the camera 9 is turned off.

In the above embodiment, the transmission speeds, 8k bps and 64k bps, are determined in view of the fact that more than 64k bps is normally required for the image communication along with the voice communication, although 8k bps is normally sufficient for the voice communication. The

10

control unit 1 may be programmed to turn off the electric power

supply to the display 8 at step 108 or in response to a keyboard

operation by the user. Further, the control unit 1 may be

programmed to change the communication speeds to more than

5   two speeds depending on the remaining battery power.

Thus, as the control unit 1 decreases the data

communication speed with the decrease in the remaining power

of the battery 12, the longevity of the battery 12 is prolonged

so that the communication period may be prolonged. Further,

10   as only the voice communication is enabled automatically when

the remaining battery power decreases, the communication with

the opponent user (call-receiver) can still be maintained

without image display. The user is enabled to recognize the

decrease in the battery power through the motionless image

15   of the opponent user on the display 8. The user can convey

it to the opponent user through the voice communication

indicating a later call.

(Second Embodiment)

In this embodiment, as shown in Figs. 4 and 5, the

20   control unit 1 is further connected to a charge control unit

13, which is connectable to an external desk-top type portable

battery charger 14 and controls charging of the built-in

battery 12 by the external power source. The battery charger

14 converts the commercial alternating current voltage 100

25   V to a direct current voltage 5.8 V. While the cellular video

telephone is mounted on the battery charger 14, the charge

control unit 13 in turn regulates the 5.8 V output of the

11

battery charger 14 to 4.1 V to charge the built-in battery 12 therewith, and stops its charging operation when the battery 12 is fully charged.

The control unit 1, particularly the microcomputer, is programmed to execute an interrupt routine shown in Fig. 6. This routine is initiated when the user completes inputting of the phone number of the opponent user (call-receiver) and pressing the SEND button on the keyboard unit 10.

In this processing, the control unit 1 first checks at step 110 whether the charge control unit 13 is connected to the battery charger 14 and the battery 12 is being charged by the battery charger 14. If the charge control unit 13 is in the battery charging operation (YES), the control unit 1 sets the communication speed to 384k bps at step 111. Then, the control unit 1 sets the frame rate to 30/s (30 frames per second) at step 112, sets the image resolution to 352×288 dots at step 113, and sets the brightness of the back-light of the display 8 to its maximum, 100%, at step 114. The control unit 1 executes both of the image communication and the voice communication at step 115. Thus, as long as the battery 12 is being charged, the data communication and image display are attained at a highest possible speed and quality.

On the other hand, if the battery charger 14 is not connected nor the charge control unit 13 is in the battery charging operation (NO), that is, if the cellular video telephone is operated solely by the battery 12, the control

unit 1 proceeds to step 116. In this instance, it may still be preferred to display the dynamic image on the display 8, even if the quality of the dynamic image display is lessened to some extent. That is, the image display is enabled with a slower motion speed of the dynamic image. Therefore, the control unit 1 sets the communication speed to a lower value, 32k bps, at step 116. Then, the control unit 1 sets the frame rate to 10/s (10 frames per second) at step 117, sets the image resolution to 176 × 144 dots at step 118, and sets the brightness of the back-light of the display 8 to 30% of its maximum at step 119 for saving the power consumption. The control unit 1 executes both of the image communication and the voice communication at step 115 with the lowered speed and quality.

In the second embodiment, it is also possible to change the data communication speed into more than two stages based on the remaining electric power of the battery 12. It is also possible to turn off the power supply to the back-light of the display 8 or enable only the voice communication, when only the built-in battery 12 is available. Further, the control processing of Fig. 6 may be executed in dependence on the user's instruction on the keyboard unit 10, or the transmission speed, frame rate, image resolution and the display brightness may be set arbitrarily by the user. The amplification of the transmission voice signal and the received voice signal may be increased when the battery 12 is charged externally.

13

The present invention should not be limited to the disclosed embodiments and modifications. For instance, the present invention may be applied to a cellular video telephone having no cameras and displays. Thus, the present invention

5   may be modified in various ways without departing from the spirit of the invention.

I CLAIM:

1.   A radio communication terminal having a built-in battery comprising:

power detecting means for detecting a remaining power of a built-in battery;

speed setting means for setting different data communication speeds based on the detected remaining power; and

data transmission control means for controlling data communication at the set data communication speeds.

2.   A radio communication terminal having a built-in battery comprising:

power supply detecting means for detecting a power supply from an external power source to a built-in battery;

speed setting means for setting different data communication speeds based on the detected power supply; and

data transmission control means for controlling data communication at the set data communication speeds, which increase as the power supply from the external power source is detected.

3.   A radio communication terminal of claim 2, further comprising:

image transmitting means for transmitting images; and

resolution setting means for setting different resolutions of the images, the resolutions being increased

15

as the power supply from the external power source is detected.

4.   A radio communication terminal of claim 2, further comprising:

display means for displaying received images;

brightness setting means for setting different brightness of the images, the brightness being increased as the power supply from the external power source is detected.

5.   A radio communication terminal having a built-in battery comprising:

image communication means for communicating images;

power detecting means for detecting a remaining power of a built-in battery;

resolution setting means for setting different resolutions of the images, the resolutions being increased as the detected remaining power increases;

speed setting means for setting different data communication speeds based on the detected remaining power, the speeds being decreased as the detected remaining power decreases; and

control means for controlling data communication and image display at the set resolutions and the set speeds.

ABSTRACT OF THE DISCLOSURE

In a cellular video telephone having a built-in battery, the remaining electric power of the battery is detected. The data communication speed and the display of image on a display are variably controlled based on the detected remaining battery power, that is, the communication speed is lowered and the display is turned off, as the remaining power decreases. Alternatively or in addition, the communication speed and the image display are controlled variably based on availability of external power source in the course of voice and image communication.

FIG. 1
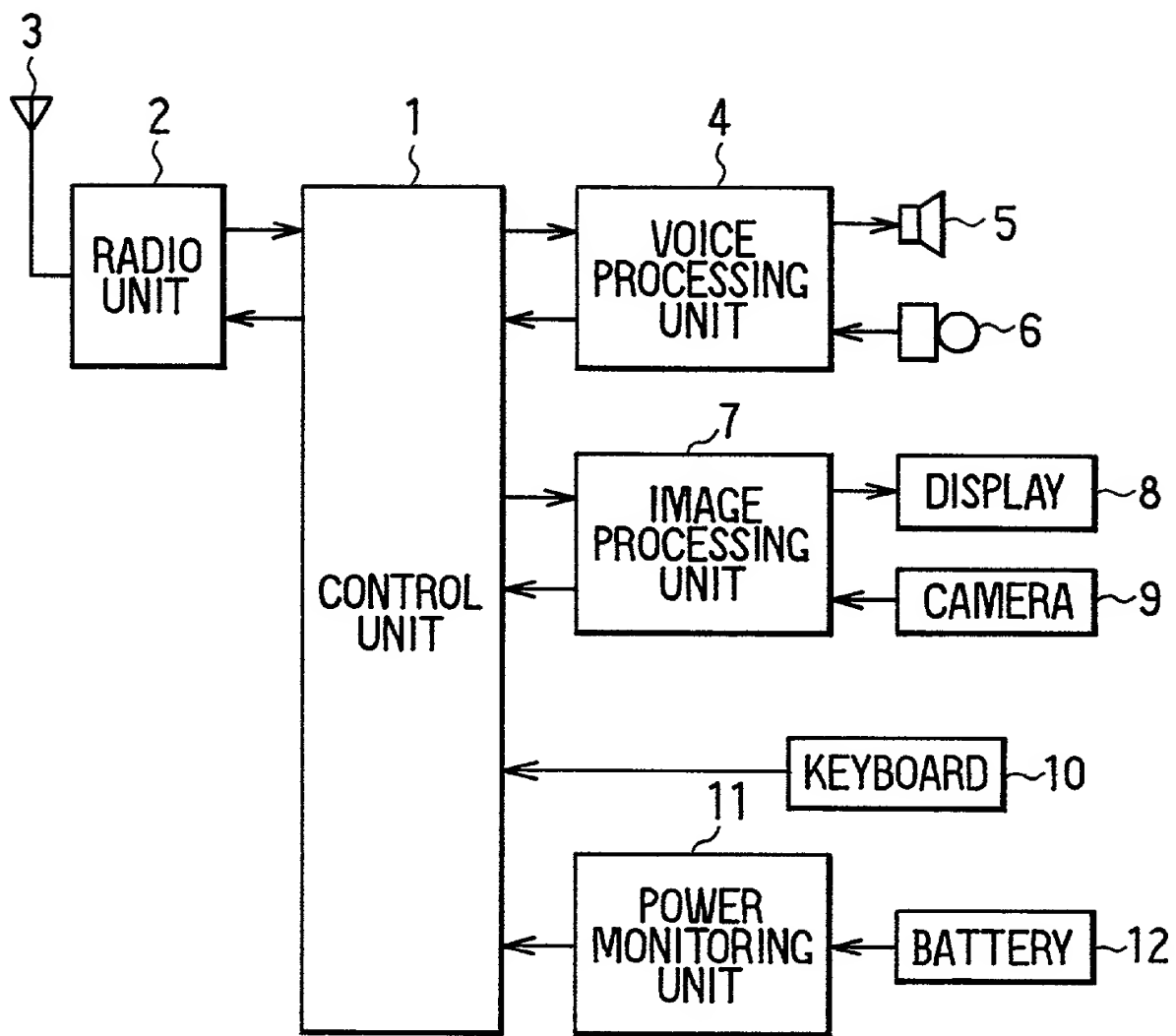
FIG. 2
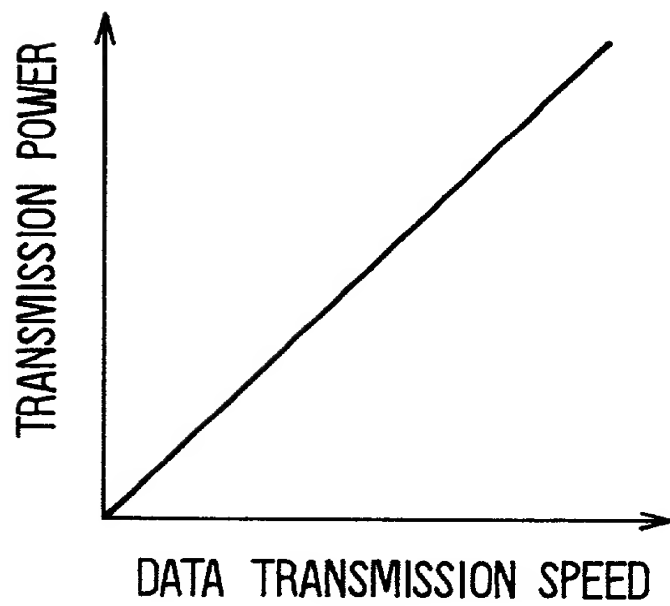
FIG. 3
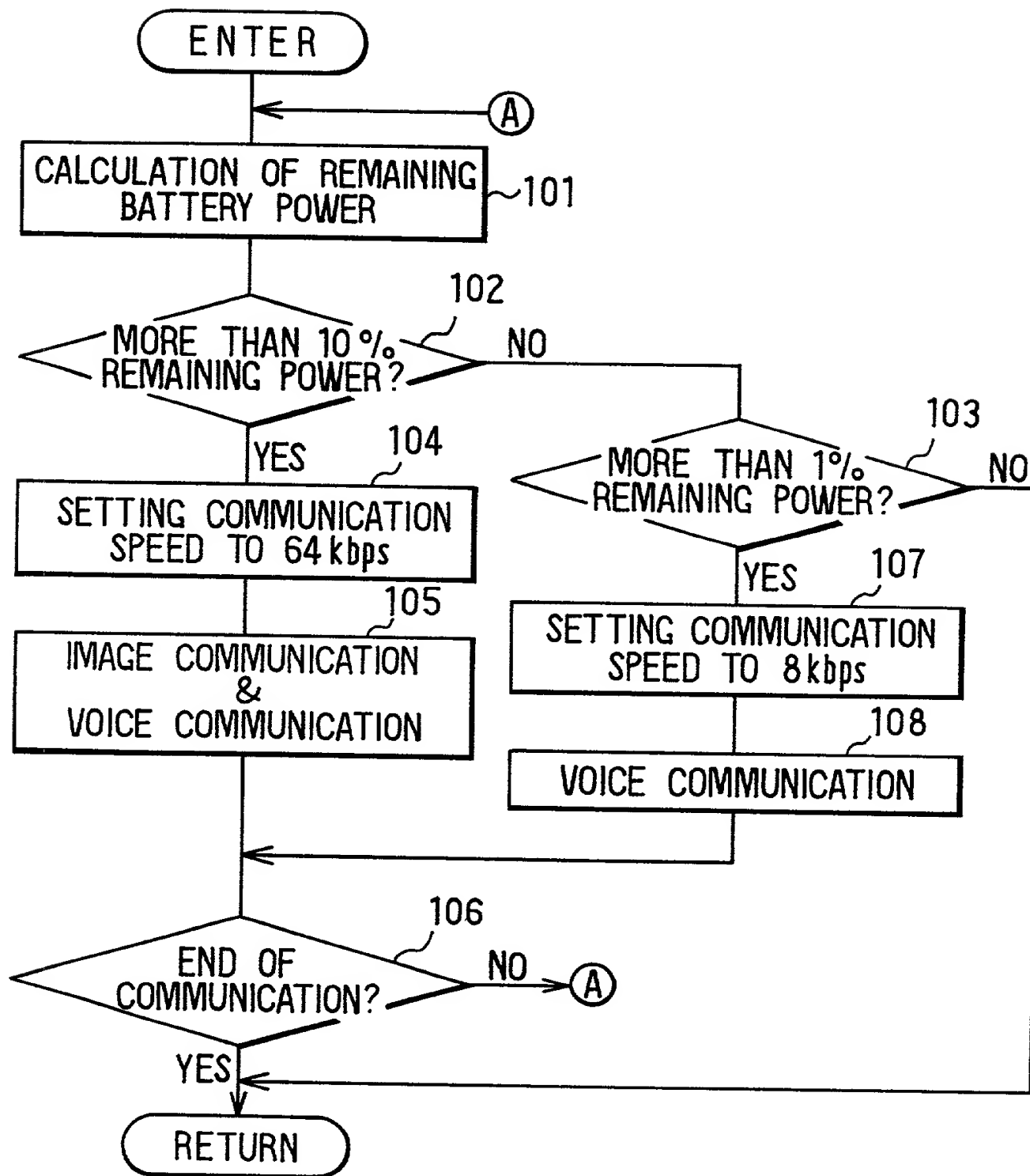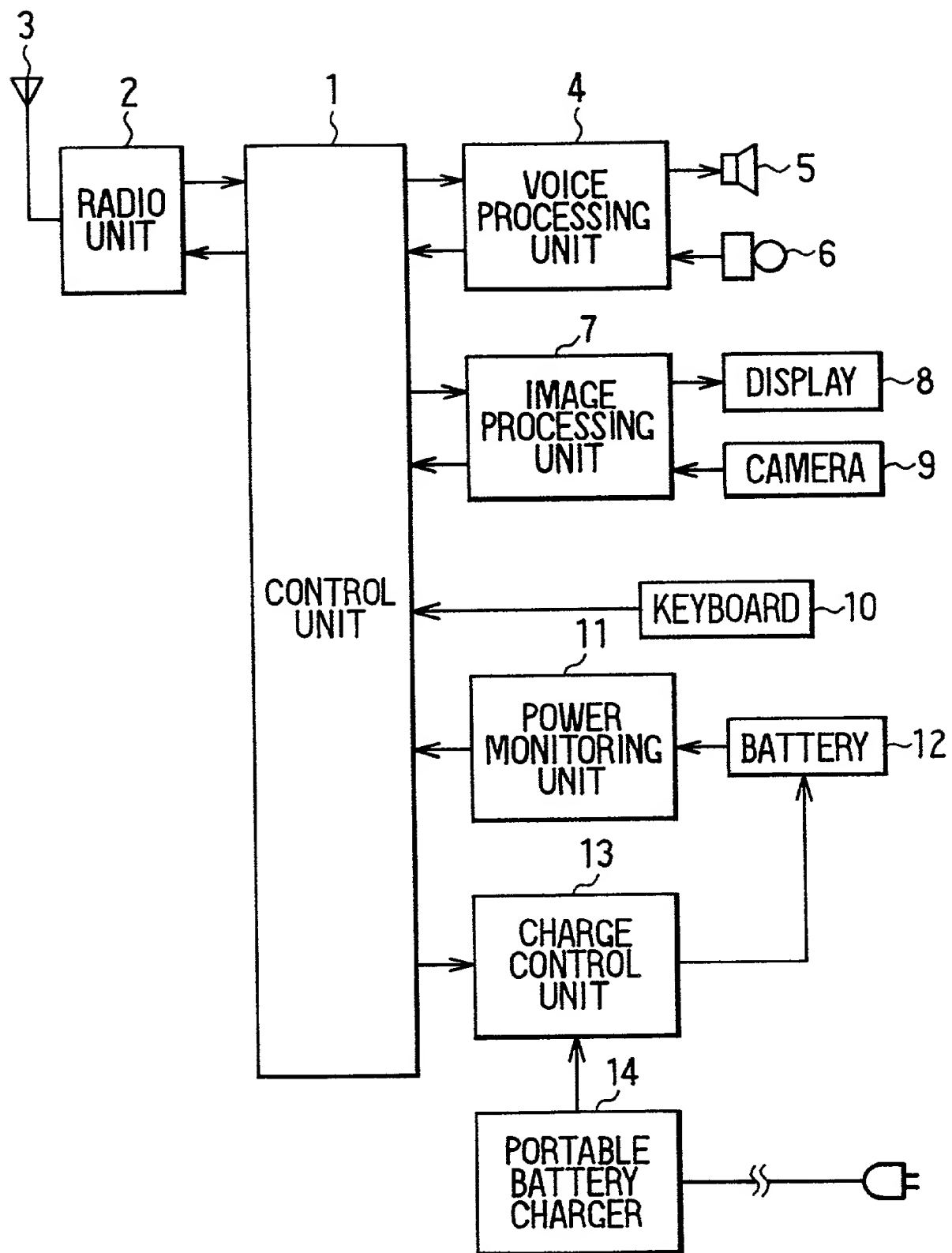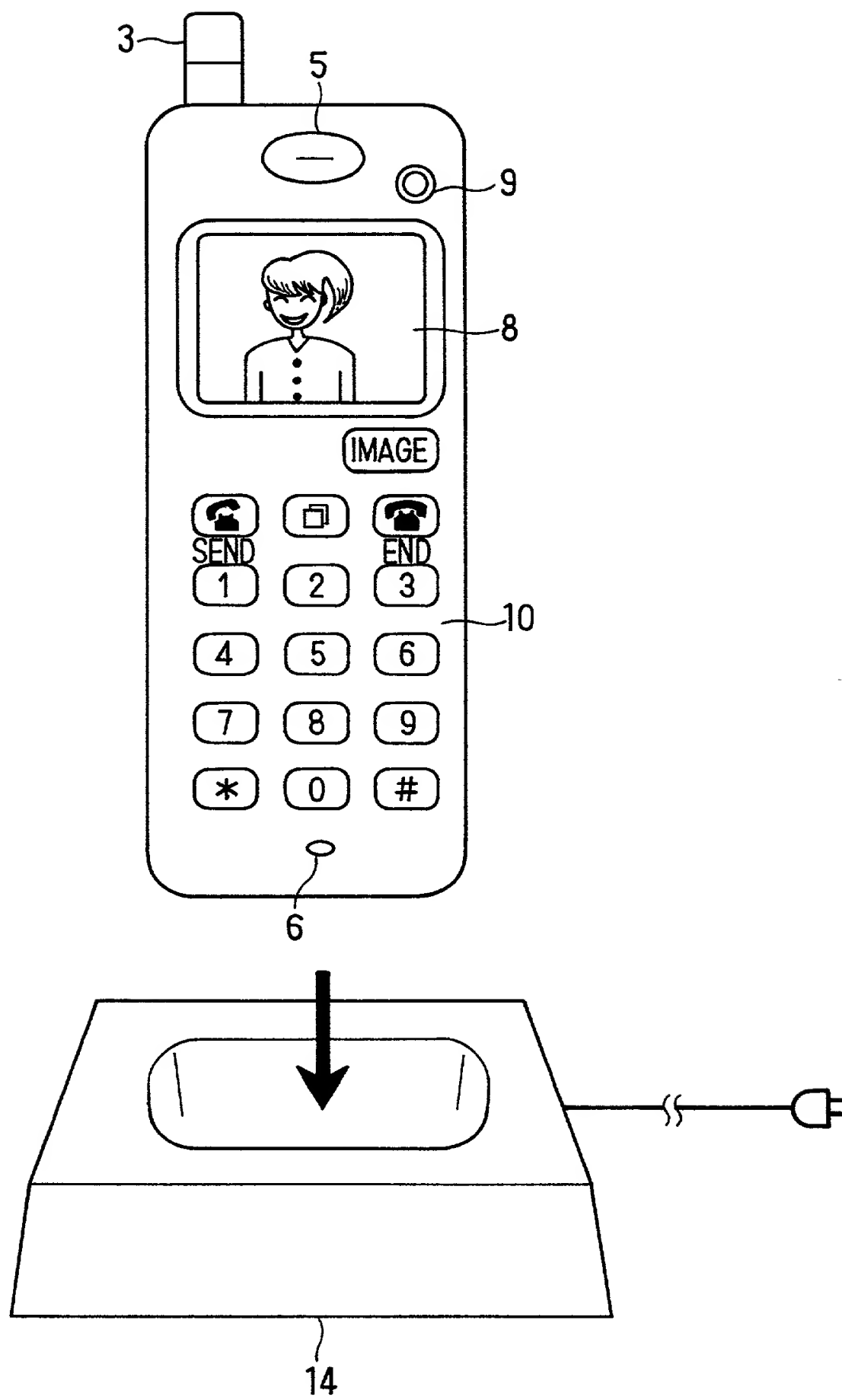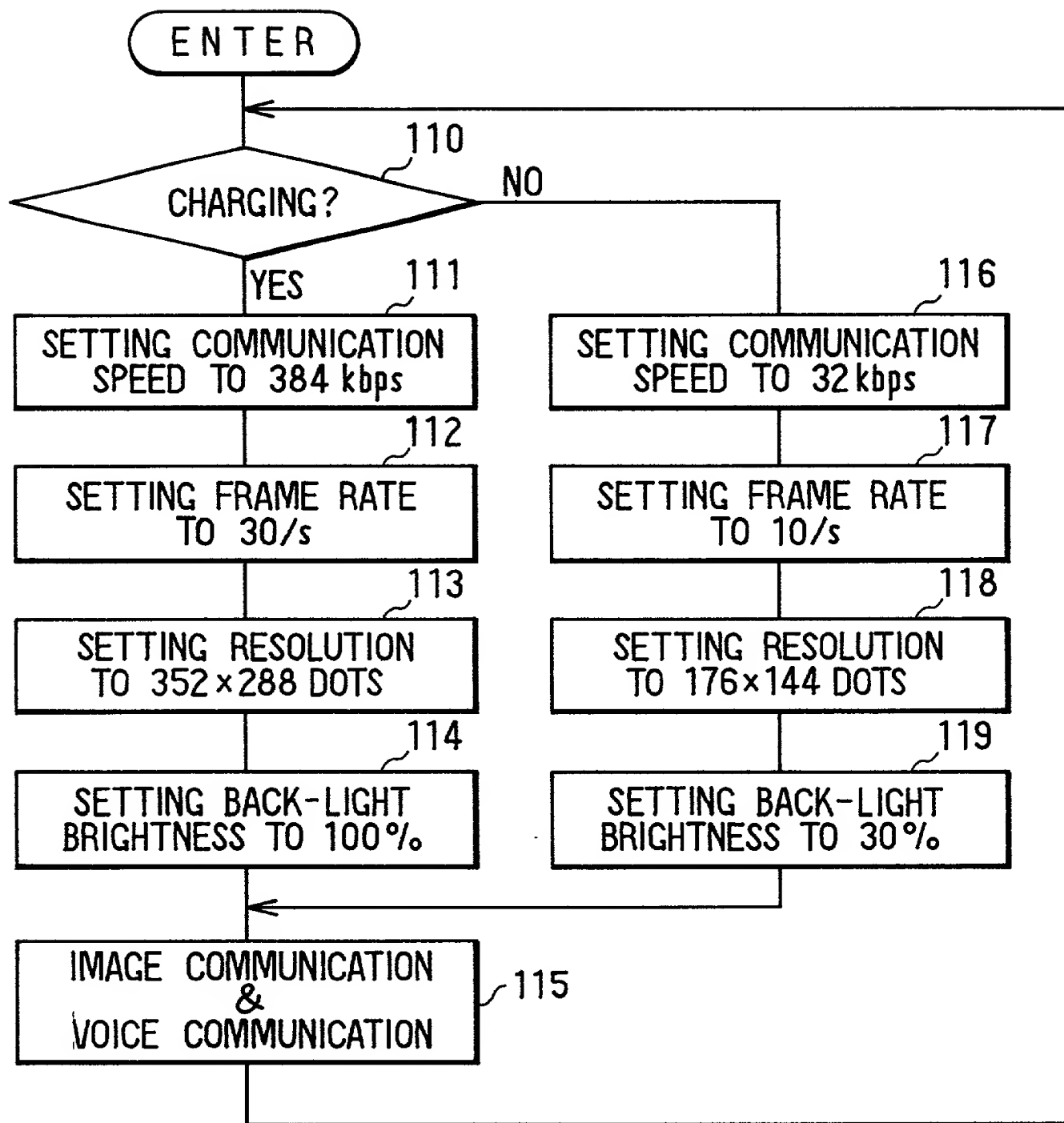
```
                    ┌─────────────┐
                    │   ENTER     │
                    └──────┬──────┘
                           │         ◄──────────── Ⓐ
                           ▼
              ┌────────────────────────┐
              │ CALCULATION OF REMAINING│  ~101
              │     BATTERY POWER       │
              └────────────┬───────────┘
                           │              102
                           ▼
                    ◇ MORE THAN 10% ◇────── NO ───────┐
                    ◇ REMAINING POWER? ◇               │
                           │                           │
                          YES      104                 ▼              103
                           ▼                    ◇ MORE THAN 1% ◇──── NO ──┐
              ┌────────────────────────┐        ◇ REMAINING POWER? ◇      │
              │ SETTING COMMUNICATION  │               │                  │
              │   SPEED TO 64 kbps     │              YES      107        │
              └────────────┬───────────┘               ▼                  │
                           │          105    ┌────────────────────────┐   │
                           ▼                 │ SETTING COMMUNICATION  │   │
              ┌────────────────────────┐     │   SPEED TO 8 kbps      │   │
              │  IMAGE COMMUNICATION   │     └────────────┬───────────┘   │
              │          &             │                  │      108      │
              │  VOICE COMMUNICATION   │                  ▼               │
              └────────────┬───────────┘     ┌────────────────────────┐   │
                           │                 │   VOICE COMMUNICATION  │   │
                           │◄────────────────└────────────────────────┘   │
                           │              106                             │
                           ▼                                              │
                    ◇ END OF ◇──────── NO ──► Ⓐ                          │
                    ◇ COMMUNICATION? ◇                                    │
                           │                                              │
                          YES ◄──────────────────────────────────────────┘
                           ▼
                    ┌─────────────┐
                    │   RETURN    │
                    └─────────────┘
```

FIG. 4

FIG. 5

FIG. 6

```
                    ( E N T E R )
                          │
                          ▼                    110
                      ╱CHARGING?╲──── NO ─────────┐
                      ╲         ╱                  │
                          │ YES                    │
                          ▼        111             ▼        116
              ┌──────────────────────┐   ┌──────────────────────┐
              │ SETTING COMMUNICATION │   │ SETTING COMMUNICATION │
              │  SPEED TO 384 kbps    │   │  SPEED TO 32 kbps     │
              └──────────────────────┘   └──────────────────────┘
                          │        112             │        117
              ┌──────────────────────┐   ┌──────────────────────┐
              │  SETTING FRAME RATE   │   │  SETTING FRAME RATE   │
              │      TO 30/s          │   │      TO 10/s          │
              └──────────────────────┘   └──────────────────────┘
                          │        113             │        118
              ┌──────────────────────┐   ┌──────────────────────┐
              │  SETTING RESOLUTION   │   │  SETTING RESOLUTION   │
              │   TO 352×288 DOTS     │   │   TO 176×144 DOTS     │
              └──────────────────────┘   └──────────────────────┘
                          │        114             │        119
              ┌──────────────────────┐   ┌──────────────────────┐
              │  SETTING BACK-LIGHT   │   │  SETTING BACK-LIGHT   │
              │  BRIGHTNESS TO 100%   │   │  BRIGHTNESS TO 30%    │
              └──────────────────────┘   └──────────────────────┘
                          │◄───────────────────────┘
                          ▼
              ┌──────────────────────┐
              │ IMAGE  COMMUNICATION  │
              │         &            │  115
              │ VOICE  COMMUNICATION  │
              └──────────────────────┘
                          │
                          └──────────────────────────────────────┘
```

Declaration and Power of Attorney For Patent Application

特許出願宣言書及び委任状

Japanese Language Declaration

日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者であると（下記の名称が複数の場合）信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

RADIO COMMUNICATION TERMINAL HAVING VARIABLE DATA

TRANSMISSION SPEED RESPONSIVE TO BUILT-IN BATTERY POWER

上記発明の明細書（下記の欄でx印がついていない場合は、本書に添付）は、

the specification of which is attached hereto unless the following box is checked:

☐ ＿月＿日に提出され、米国出願番号または特許協定条約国際出願番号を＿＿＿＿とし、（該当する場合）＿＿＿＿に訂正されました。

☐ was filed on ＿＿＿＿＿＿＿＿＿＿
as United States Application Number or
PCT International Application Number
＿＿＿＿＿＿＿＿＿
and was amended on
＿＿＿＿＿＿＿＿＿
(if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の付与について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Japanese Language Declaration
（日本語宣言書）

私は、米国法典第３５編１１９条 (a) - (d) 項又は３６５条 (b) 項に基き下記の、米国以外の国の少なくとも一ヵ国を指定している特許協力条約３６５ (a) 項に基ずく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

I hereby claim foreign priority under Title 35, United States Code, Section 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Claim

Prior Foreign Application(s)
外国での先行出願

10-214477	Japan	29/July/1998	x	
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
（番号）	（国名）	（出願年月日）		
10-312030	Japan	02/November/1998	x	
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
（番号）	（国名）	（出願年月日）		

私は、第３５編米国法典１１９条 (e) 項に基いて下記の米国特許出願規定に記載された権利をここに主張いたします。

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application No.)	(Filing Date)	(Application No.)	(Filing Date)
（出願番号）	（出願日）	（出願番号）	（出願日）

私は、下記の米国法典第３５編１２０条に基いて下記の米国特許出願に記載された権利、又は米国を指定している特許協力条約３６５条 (c) に基ずく権利をここに主張します。また、本出願の各請求範囲の内容が米国法典第３５編１１２条第１項又は特許協力条約で規定された方法で先行する米国特許出願に開示されていない限り、その先行米国出願書提出日以降で本出願書の日本国内または特許協力条約国際提出日までの期間中に入手された、連邦規則法典第３７編１条５６項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of application.

(Application No.)	(Filing Date)	(Status: Patented, Pending, Abandoned)
（出願番号）	（出願日）	（現況： 特許許可済、係属中、放棄済）
(Application No.)	(Filing Date)	(Status: Patented, Pending, Abandoned)
（出願番号）	（出願日）	（現況： 特許許可済、係属中、放棄済）

私は、私自身の知識に基づいて本宣言書中で私が行なう表明が真実であり、かつ私の入手した情報と私の信じるところに基づく表明が全て真実であると信じていること、さらに故意になされた虚偽の表明及びそれと同等の行為は米国法典第１８編第１００１条に基ずき、罰金または拘禁、もしくはその両方により処罰されること、そしてそのような故意による虚偽の声明を行なえば、出願した、又は既に許可された特許の有効性が失われることを認識し、よってここに上記のごとく宣言を致します。

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Japanese Language Declaration
（日本語宣言書）

委任状：　私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。（弁護士、または代理人の氏名及び登録番号を明記のこと）

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith *(list name and registration number)*

書類送付先

Send Correspondence to:

Scott C. Harris
FISH & RICHARDSON
4225 Executive Square, Suite 1400
La Jolla, CA 92037

直接電話連絡先：　（名前及び電話番号）

Direct Telephone Calls to: *(name and telephone number)*
Scott C. Harris
(619) 678-5070

唯一または第一発明者名	Full name of sole or first inventor
Akio KOSAKA	

発明者の署名　　　　　日付	Inventor's signature	Date
Akio Kosaka · *June 9, 1999*		

住所	Residence
Chiryu-city	

国籍	Citizenship
Japan	

私書箱	Post Office Address
c/o DENSO CORPORATION 1-1 Showa-cho, Kariya-city, Aichi-pref., 448-8661 Japan	

第二共同発明者	Full name of second joint inventor, if any

第二共同発明者　　　　日付	Second inventor's signature	Date

住所	Residence

国籍	Citizenship

私書箱	Post Office Address

（第三以降の共同発明者についても同様に記載し、署名をすること）

(Supply similar information and signature for third and subsequent joint inventors.)